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IS 10026-3-8 (1986): Insulating varnishes containing solvents, Part 3: Specifications for individual materials, Section 8: Baking varnishes with temperature index 200 [ETD 2: Solid Electrical Insulating Materials and Insulation Systems]



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Indian Standard

SPECIFICATION FOR
INSULATING VARNISHES
CONTAINING SOLVENTS

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 8 Baking Varnishes with Temperature Index 200

(First Reprint FEBRUARY 1998)

UDC 621.315.617.3 : 667.637.4

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Indian Standard

SPECIFICATION FOR INSULATING VARNISHES CONTAINING SOLVENTS

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 8 Baking Varnishes with Temperature Index 200

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(Continued on page 2)

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IS : 10026 (Part 3/Sec 8) - 1986

(Continued from page 1)

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Indian Standard
**SPECIFICATION FOR
INSULATING VARNISHES
CONTAINING SOLVENTS**

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 8 Baking Varnishes with Temperature Index 200

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 22 May 1986, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electro-technical Division Council.

0.2 This standard deals with insulating varnishes containing solvents. It consists of the following three parts:

Part 1 Definitions and general requirements;

Part 2 Methods of tests; and

Part 3 Specifications for individual materials.

0.3 This standard (Part 3/Sec 8) covers requirements for baking varnishes with temperature index 200.

0.4 This standard specifies optional requirements for density, flashpoint, dilution ability, reaction of varnish with copper which shall be carried out, if agreed to between the purchaser and the supplier, and shall be within the limits when compared with declared values applying the tolerances given in Table 1.

0.5 Impregnating varnishes are classified in two types as follows:

- a) Flexible, and
- b) Hard.

0.6 This standard (Part 3/Sec 8) should be read in conjunction with IS : 10026 (Part 1)-1981* and IS : 10026 (Part 2)-1982†.

*Specification for insulating varnishes containing solvents: Part 1 Definitions and general requirements.

†Specification for insulating varnishes containing solvents: Part 2 Methods of test.

IS : 10026 (Part 3/Sec 8) - 1986

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 3/Sec 8) covers the requirements for both impregnating and finishing insulating varnishes containing solvents, curing of which requires the application of heat and which are of temperature index 200.

2. DEFINITIONS

2.1 All materials in a consignment shall comply with the requirements given in IS : 10026 (Part 1)-1981†, for colour, condition of supply and shelf life.

3. PERFORMANCE REQUIREMENTS

3.1 When tested according to the relevant methods described in IS : 10026 (Part 2)-1982‡, the material shall conform to the requirements given in Table 1.

TABLE 1 SCHEDULE OF CHARACTERISTICS

(Clauses 0.4 and 3.1)

SL No.	PROPERTY	TEST METHOD AND CL No.	REQUIREMENT	REMARKS
(1)	(2)	(3)	(4)	(5)
i)	Density*	3 of IS : 10026 (Part 2)-1982	± 0.05 of the nominal value	Nominal value to be agreed upon between the purchaser and the supplier
ii)	Viscosity†	4 of IS : 10026 (Part 2)-1982	± 15 percent of the nominal value	Nominal value to be agreed upon between the purchaser and the supplier
iii)	Non-volatile matter‡	5 of IS : 10026 (Part 2)-1982	± 2 percent of the nominal value. 40 percent, <i>Min</i>	Nominal value to be agreed upon between the purchaser and the supplier

(Continued)

*Rules for rounding off numerical values (revised).

†Specification for insulating varnishes containing solvents: Part 1 Definitions and general requirements.

‡Specification for insulating varnishes containing solvents: Part 2 Methods of test.

TABLE 1 SCHEDULE OF CHARACTERISTICS — *Contd*

SL No.	PROPERTY	TEST METHOD AND CL No.	REQUIREMENT	REMARKS
(1)	(2)	(3)	(4)	(5)
iv)	Drying in thin film	6 of IS : 10026 (Part 2)-1982	Non-tacky in not more than 4 hours	See Note 1
v)	Flash point, <i>Min</i> *	7 of IS : 10026 (Part 2)-1982	23°C	—
vi)	Dilution ability or compatibility, percent, <i>Min</i> *	8 of IS : 10026 (Part 2)-1982	100	—
vii)	Ability to cure in considerable thickness†	9 of IS : 10026 (Part 2)-1982	Not worse than S-2, U-1 and I4'2	See Note 1
viii)	Check for resoftening‡	10 of IS : 10026 (Part 2)-1982	Not worse than W.2	—
ix)	Reaction of varnish with copper*	11 of IS : 10026 (Part 2)-1982	Copper shall not change colour	—
x)	Stability of varnish in an open vessel†	12 of IS : 10026 (Part 2)-1982	Change in viscosity not more than 3 times the original value. No skin formation, precipitation or gelled lumps	—
xi)	Effect of varnish on enamelled wire†	13 of IS : 10026 (Part 2)-1982	Pencil hardness not softer than H	Applicable for impregnating varnishes only
xii)	Flexibility test:	14 of IS : 10026 (Part 2)-1982		
	a) Mandrel test†		No cracking of varnish film, detectable by normal vision	Applicable for flexible varnishes only
	b) Adhesive strength, N/mm ² , <i>Min</i>		4.5	See Note 1
xiii)	Resistance to transformer oil:	15 of IS : 10026 (Part 2)-1982		
	a) Visual examination		No evidence of attack	—
	b) Total acidity, mg KOH/g, <i>Max</i>		0.40	
	c) Sludge value, percent by mass, <i>Max</i>		0.10	

(Continued)

TABLE 1 SCHEDULE OF CHARACTERISTICS — *Contd*

SL No.	PROPERTY	TEST METHOD AND CL No.	REQUIREMENT	REMARKS
(1)	(2)	(3)	(4)	(5)
xiv)	Effect of heat ageing on flexibility	16 of IS : 10026 (Part 2)-1982	No visible damage or of detachment of the film on convex side, on bending over a mandrel of diameter 4.75 mm	For flexible varnishes only
xv)	Electric strength, kV/mm, Min:	17 of IS : 10026 (Part 2)-1982		See Note 1
	a) In air, at room temperature†		50	See Note 1
	b) In air at 200°C		35	—
	c) After immersion in water†		Value	—
	d) In liquid chemicals		To be agreed to between the purchaser and the supplier	The type of chemical and its concentration to be agreed upon between the purchaser and the supplier
xvi)	Volume resistivity ohm. cm, Min†:	19 of IS : 10026 (Part 2)-1982		
	a) In air		1×10^{12}	See Note 1
	b) After immersion in water		1×10^9	After seven days of immersion in water
xvii)	Bond strength coefficient†	20 of IS : 10026 (Part 2)-1982	1.5 Max 1.5 Min	For flexible insulating varnishes only For hard varnishes only
xviii)	Dissipation factor and permittivity	21 of IS : 10026 (Part 2)-1982	Under consideration	—
xix)	Thermal endurance	22 of IS : 10026 (Part 2)-1982	Temperature index not less than 200	a) Reduction in electric strength to 12 kV/mm b) Loss of mass up to 30 percent (see Note 2) c) Bond strength (helical coil method) up to 50 percent of initial value

NOTE 1 — Temperature and time for curing of each coat is to be recommended by the supplier. The test is not applicable to finishing varnishes.

NOTE 2 — Correction due to inorganic content of the silicone varnish shall be considered while determining loss in mass in percentage.

*Optional requirements to be carried out, if agreed to between the purchaser and the supplier.

†Shall be carried out as routine test.

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